

What is claimed is:

1. An article of manufacture, comprising:

- a) a polymer substrate, and
- b) a digitally encoded image made with ink;

wherein said polymer substrate forms a lens;

wherein said polymer substrate is subjected to a pre-treatment process that precedes the application of said digitally encoded image to said polymer substrate; and

wherein said pre-treatment process results in an enhanced image quality of said digitally encoded image.

2. The article of manufacture of claim 1, wherein said digitally encoded image is made at least in part using said pre-treatment process.

3. The article of manufacture of claim 1, wherein said pre-treatment process comprises one or more chemical modification of said polymer substrate.

4. The article of manufacture of claim 3, wherein said one or more chemical modification of said polymer substrate is selected from the group consisting of: chemical cleaning, chemical texture modification, chemical or electrochemical activation or creation of reactive groups on or within said polymer substrate, application of one or more chemicals to said polymer substrate, and combinations thereof.

5. The article of manufacture of claim 1, wherein said pre-treatment process comprises the application of an image receiver layer.

6. The article of manufacture of claim 5, wherein said image receiver layer comprises a chemical coating applied to the surface of said polymer substrate.

7. The article of manufacture of claim 5, wherein said image receiver layer has a thickness of between about 0.1 micrometers to about 200 micrometers.

8. The article of manufacture of claim 5, wherein said image receiver layer has a thickness of between about 0.1 micrometers to about 100 micrometers.

9. The article of manufacture of claim 5, wherein said image receiver layer has a thickness of between about 0.1 micrometers to about 20 micrometers.

10. The article of manufacture of claim 5, wherein said image receiver layer is applied to the entire area of said polymer substrate.
11. The article of manufacture of claim 5, wherein said image receiver layer is applied to one or more partial area of said polymer substrate.
- 5 12. The article of manufacture of claim 5, wherein said image receiver layer is applied to a prior layer on or in said polymer substrate.
13. The article of manufacture of claim 12, wherein said prior layer is a prior polymer layer containing a coloring agent.
14. The article of manufacture of claim 5, wherein said image receiver layer comprises a highly absorbent polymer.
- 10 15. The article of manufacture of claim 14, wherein said highly absorbent polymer comprises a polyvinylpyrrolidone homopolymer, a polyvinylpyrrolidone copolymer, a polyacrylamide homopolymer, a polyacrylamide copolymer, a polyacrylate homopolymer, a polyacrylate copolymer, a proteinaceous material, a carbohydrate, or a combination thereof.
- 15 16. The article of manufacture of claim 5, wherein said image receiver layer is non-transiently incorporated into or onto said polymer substrate .
17. The article of manufacture of claim 5, wherein said image receiver layer is a temporary coating.
- 20 18. The article of manufacture of claim 17, wherein said image receiver layer is substantially removable during the normal post-fixation processes.
19. The article of manufacture of claim 5, wherein said image receiver layer is applied prior to, simultaneously with, or after exposure of said polymer substrate to an activating substance.
- 25 20. The article of manufacture of claim 5, wherein said image receiver layer is compatible with a base treatment of said polymer substrate.
21. The article of manufacture of claim 19, wherein said activating substance comprises a base.

22. The article of manufacture of claim 5, wherein said image receiver layer is applied by direct coating, application of droplets or microdroplets, ink jet printing, soaking, impregnation, spin coating, dip coating, curtain coating, or pad printing.

23. A method of making an article of manufacture comprising a polymer substrate and a digitally encoded image made with ink, wherein said polymer substrate forms a lens, comprising:

a) subjecting said polymer substrate to a pre-treatment process; and

b) applying said digitally encoded image to said polymer substrate,

wherein said pre-treatment process results in an enhanced image quality of said digitally encoded image.

24. The method of claim 23, wherein said pre-treatment process is applied to said lens.

25. The method of claim 23, wherein said digitally encoded image is applied to said lens.

26. The method of claim 25, wherein said digitally encoded image is applied in whole or in part directly to said lens.

27. The method of claim 25, wherein said digitally encoded image is applied in whole or in part indirectly to said lens.

28. The method of claim 25, wherein said digitally encoded image is applied to one or more portions of said lens.

29. The method of claim 23, wherein said digitally encoded image is made at least in part using said pre-treatment process.

30. The method of claim 23, wherein said pre-treatment process is applied to one or more portions of the polymer substrate.

31. The method of claim 23 wherein said pre-treatment process comprises one or more chemical modification of said polymer substrate.

32. The method of claim 31, wherein said one or more chemical modification of said polymer substrate is selected from the group consisting of: chemical cleaning, chemical texture modification, chemical or electrochemical activation or creation of reactive groups on or within said polymer substrate, application of one or more chemicals to said polymer substrate, and combinations thereof.

33. The method of claim 23, wherein said pre-treatment process comprises the application of an image receiver layer.
34. The method of claim 33, wherein said image receiver layer comprises a chemical coating applied to the surface of said polymer substrate.
- 5 35. The method of claim 33, wherein said image receiver layer has a thickness of between about 0.1 micrometers to about 200 micrometers.
36. The method of claim 33, wherein said image receiver layer has a thickness of between about 0.1 micrometers to about 100 micrometers.
37. The method of claim 33, wherein said image receiver layer has a thickness of between
10 about 0.1 micrometers to about 20 micrometers.
38. The method of claim 33, wherein said image receiver layer is applied to the entire area of said polymer substrate.
39. The method of claim 33, wherein said image receiver layer is applied to one or more partial area of said polymer substrate.
- 15 40. The method of claim 33, wherein said image receiver layer is applied to a prior layer on or in said polymer substrate.
41. The method of claim 40, wherein said prior layer is a prior polymer layer containing a coloring agent.
42. The method of claim 33, wherein said image receiver layer comprises a highly absorbent
20 polymer.
43. The method of claim 42, wherein said highly absorbent polymer comprises a polyvinylpyrrolidone homopolymer, a polyvinylpyrrolidone copolymer, a polyacrylamide homopolymer, a polyacrylamide copolymer, a polyacrylate homopolymer, a polyacrylate copolymer, a proteinaceous material, a carbohydrate, or a combination thereof.
- 25 44. The method of claim 33, wherein said image receiver layer is non-transiently incorporated into or onto said polymer substrate .
45. The method of claim 33, wherein said image receiver layer is a temporary coating.
46. The method of claim 45, wherein said image receiver layer is substantially removable during the normal post-fixation processes.

47. The method of claim 33, wherein said image receiver layer is applied prior to, simultaneously with, or after exposure of said polymer substrate to an activating substance.
48. The method of claim 33, wherein said image receiver layer is compatible with a base treatment of said polymer substrate.
49. The method of claim 47, wherein said activating substance comprises a base.
50. The method of claim 33, wherein said image receiver layer is applied by direct coating, application of droplets or microdroplets, ink jet printing, soaking, impregnation, spin coating, dip coating, curtain coating, or pad printing.
51. An article of manufacture, comprising:
- a) a polymer substrate
 - b) a digitally encoded image made with ink comprising reactive components, wherein said polymer substrate forms a lens; wherein said digitally encoded image is applied to said polymer substrate by ink jet printing; and wherein each said reactive component is stored in an ink jet printer cartridge.
52. The article of manufacture of claim 51, wherein said reactive components are stored in separate ink jet printer cartridges.
53. The article of manufacture of claim 51, wherein said ink comprises one or more polymerizable monomer and one or more initiator; and wherein each said one or more polymerizable monomer and said one or more initiator are stored in an ink jet printer cartridge.
54. The article of manufacture of claim 51, wherein said reactive components are stored in separate ink jet printer cartridges.